Does Financial Development Promote Economic Growth in India?

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Abstract: The association between economic growth and financial development has been a wide-ranging subject of experiential research. The practical evidence suggests that there is a significant positive relationship between financial development and economic growth. However, these findings do not establish the direction of causality between the two. The question, therefore, is whether financial development causes economic growth or vice versa. In view of the above discussion, the article attempts to explore the relationship between financial development and economic growth in Indian context using granger causality test for the period, 1990-91 to 2010-11. The estimated results confirmed that financial development, measured by ratio of gross domestic capital formation to GDP , ratio of gross domestic savings to GDP, etc are non-stationary at the level data and at the first differences when using ADF test but attains stationary at first difference while using PP test. The Granger- causality test finally confirmed that financial development granger causes economic growth in India between time span of 1990-91 to 2010-11. Therefore, financial development in India has a stronger role in the growth process. The implication of the above is that India is in a better state of affairs as far as the growth potential is concerned by way of a more efficient financial system that is likely to evolve in the upcoming years to suit the changing global pursuit.

1 Introduction

The association between economic growth and financial development has been a wide-ranging subject of experiential research. The practical evidence suggests that there is a significant positive relationship between financial development and economic growth. The endogenous growth literature provides copious evidence that financial development is a key determinant of economic growth. Theory interconnects these two factors based on the logic that by reducing information, transaction, and monitoring costs, a well-developed financial system performs several critical functions to augment intermediation efficiency. In due course, enhanced financial intermediation efficiency causes economic growth. Therefore, the fact that well-built correlation exists between finance and economic growth has been well documented in the economic development literature. However, these findings do not establish the direction of causality between the two. Even though economists have accepted effects of financial development on economic growth, they do not have the same idea about the direction of causality, which means whether financial development causes economic growth or economic growth causes financial development. Rather, previous empirical studies have produced mixed and conflicting results on the nature and direction of the causal relationship between finance and economic growth. The question, therefore, is whether financial development causes economic growth or vice versa. India is one of the most emerging countries in the world in globalized era, predominantly since the initiation of liberalization in 1991. The globalization of 1990s has generated a mixture of accomplishments and disappointments in the Indian economy. One of such achievements is attainment of economic growth and its interconnection with financial development.

In view of the above discussion, the article attempts to explore the relationship between financial development and economic growth in Indian context.

2 Literature review

It is commonly accepted that financial development is a concept with multidimensional characteristics and constitutes a predominantly significant mechanism for long run economic growth. There are abundant studies that support the relationship between financial development and economic growth, both theoretically and empirically (Baltagi et al., 2008; Abu-Bader and Abu-Qarn, 2008; Demetriades and Andrianova, 2004; Godhart, 2004; Levine, 2003; Beck et al., 2000; Von Furstenberg and Fratianni, 1996; King and Levine, 1993). The theoretical foundation of this relationship can be traced back to the work of Schumpeter (1911). Existing Literature presents three outlooks regarding the potential importance of finance in economic growth. While the first one of these considers finance as a critical element of growth (Schumpeter, 1911; Goldsmith, 1969; McKinnon, 1973; Shaw, 1973; Odedokun, 1996), finance is regarded as a relatively trivial factor in growth according to second opinion (Robinson, 1952; Lucas, 1988; Stern, 1989). Finally third observation thinks of on the potential negative impact of finance on growth (Van Wijnbergen, 1983; Buffie, 1984). Parallel to these views, empirical studies of the effects of financial development on economic growth have generated diverse evidences showing specially no role or positive relationship (Xu, 2000). The different studies have been put forth in tabular form below.

Table 1. Literature Review

Studies	Nature of Studies	Major Findings/Results
Benecivenga and Smith (1991)	Theoretical study	Model estimates that developments in finance affect real growth rate.
King and Levine (1993)	International study includes 80 countries between years 1960-1980	All indicators of financial growth are related to the next growth rate and increments in economic efficiency.
Obsfield (1994)	Theoretical study	There is a positive relation between liquid stock markets and economic growth, but neither liquidity nor integration with international capital market are related to private sector deposits.
Benecivega (1995)	Theoretical study	There is a strong relationship between equity markets liquidities, growth rate, increments in production and capital accumulation.
Levine and Zervos (1996)	Horizontal cross analysis using with 3 growth rate as dependent variable which covers 72 countries.	There is a meaningful relationship between financial deepening and growth.
Levine (1997)	Horizontal cross analysis	There is a positive relationship between financial development and economic growth.
Rousseau and Wachtel (1998)	Time series analysis for 5 industrial notions(USA, Canada, England, Switzerland, Norway)	With small feed back evidence, finance anticipates growth.
Rajan and Zingales (1998)	International time series analysis (1980-1990)	Financial development has a strong effect on economic growth.
Neusser and Kugler (1998)	Production industry time series analysis belong to OECD countries	Finance anticipates growth. Financial development is co-integrated with the manufacturing industry s total efficiency and its GDP.
Levine and Zervos (1998)	International analysis (1976-93)	Both liquid stock markets and growth banking sector have a positive effect on developing, capital accumulation and production. Capital stock market dimension is not correctly related to international integration and volatility.
Demirgüç-Kunt and Maksimoviç	International analysis for 30 developed and developing	Real capital stock market and well growth system make a firm easy to develop.

(1998)	countries	
Luitel and Khan 1999	10 sample Countries, VAR	Bi-directional causality between financial development and economic growth.
Levine, Beck and Loayza (2000)	Horizontal cross analysis and dynamic panel techniques	There is a strong positive relationship between financial developing and long run growth.
Zhenhui Xu (2000)	International study, VAR analysis in 41 countries (1960-1993)	Study rejects the demand following model and effects of financial development on economic growth.
Jordan Z. Shan(2001)	International study, Granger Causality Test for 9 OECD countries and China	Some evidences were found that in half of the countries there were bilateral causality and in three of them have an inverse causality.
Al-taimi, Hussein, Al-Awad and Charif (2001)	Selected Arab Countries, Cointegration, Granger causality, and the IRF technique	No clear evidence that financial development affect or is affected by economic growth.
Al-Yousif 2002	1970-1999/ 30 developing Countries, Granger causality test	Causality is bi-directional; the finance growth relationship between cannot be generalized across countries.
Misra(2003)	Credit-output nexus analysis by using data of 25 Indian states during the period of 1981-2000, VECM.	Significant support in favour of the credit-output nexus in Indian Sates.
Shandre M. Thangevelu and Ang Bang James Jiunn (2004)	Time series analysis for Australia	Study represents evidences that financial markets have causal effect on growth. Moreover, there are evidences that there is a causal effect from economic growth to financial intermediary. However, there is not any causal effect from economic growth to financial development.
Abu- Bader and Abu-Qarn, (2005)	Causal relationship between financial development and economic growth in Egypt during the period 1960-2001 , trivariate VAR setting, Granger causality tests using the cointegration and vector error correction methodology.	The financial reforms launched in 1990 can explain the rebound in economic performance since then and that further deepening of the financial sector is an important instrument to stimulate saving/investment and therefore long-term economic growth
Nicholas M Odhiambo(2008)	Dynamic causal relationship between stock market development and economic growth in South Africa DURING 1971-2007, ARDL-Bounds testing procedure	Causal relationship between stock market development and economic growth is sensitive to the proxy used for measuring the stock market development.

Source: (Kularatne, 2001), (Küçükaksoy Aslan, 2006) as cited in Selda Vuranok (2009) and modified by Author.

3 Theoretical background behind nexus between Financial Development and Economic Growth

The existence of a relationship between financial development and economic growth is extensively recognized. A lot of researchers has done their research studies on this issue and definitely confirmed it. The question of debate lies in the direction of causality between finance and growth. The direction of causality has been described by Patrick (1966) as supply- leading and demand-following hypothesis. This hypothesis was supported by Mckinnon (1988). Three possible relationships between financial development and economic growth are examined here: finance-led growth (Supply–Leading Hypothesis), growth-driven finance (demand-following hypothesis), and the two-way causal relationship that is termed feedback (Bi-directional Causality).

3.1 Finance-led growth/ Supply – Leading Hypothesis

When the causal relationship moves from financial development to economic growth, it is considered to be supply-leading because it is supposed that the activities of the financial institution increase the supply of financial services which creates economic growth. The advocates of this hypothesis consider that the activities of the financial institutions provide as a constructive tool for increasing the productive capacity of the economy. They assert that countries with better developed financial system tend to grow quicker. The finance led growth hypothesis suggests that financial development plays a major role in economic growth. The hypothesis argues that financial development has an inspiring impact on the economy. Several channels through which financial development promotes growth in the economy comprise of efficient allocation of capital, mobilization of savings through attractive instruments, lowering of cost of information gathering and presenting among others. Fundamentally, an efficient financial sector is seen as supplier of limited credit resources from the surplus units to the deficits. Through this process the financial sector helps to prop up efficient allocation of resources. Empirical evidence in support of this hypothesis has been cited in the works of Levine (1997), King and Levine (1993a, 1993b), Rajan and Zingales (1998), Darrat, (1999), Ghali, (1999), and Luintel and Khan (1999), Arestis et. al, (2001); Jalilian and Kirkpatrick, (2002); Bhattacharya and Sivasubramanian, (2003); Abu- Bader and Abu-Qarn, (2005) and Habibullah and End, (2006).

3.2. Growth-driven finance/ Demand – Following Hypothesis

Similarly, when the growth within the economy results in increase in the demand for financial services and this afterward motivates financial development, then it is regarded as demand-following hypothesis. Despite the above views, growth is at times seen as unrelated to banks. A number of research efforts assume that economic growth is a causal factor for financial development. According to them, as the real

sector grows, the increasing demand for financial services stimulates the financial sector (Gurley & Shaw 1967). In contrast to the finance-led growth hypothesis, economists like Robinson (1952), Kuznets (1955) and Stem (1989) have argued that increase in growth normally leads to increased financial development. In the opinion of Robinson (1952), it seems to be the case that where enterprises lead, finance follows. Kuznets (1955) equally states that financial markets begin to grow as the economy approaches the intermediate stage of growth process and develop once the economy becomes matured. The argument is that high economic growth generates demand for some categories of financial instruments and arrangement and that financial market effectively respond to these demands and change. Empirical studies in support of growth driven finance include Agbetsiafa (2003), Waqabaca, (2004), Odhiambo (2004,2008).

3.3 Feedback/ Bi-directional causality:

There are a group of economists who suppose that causality runs in both directions. The advocates of this view assume that there is a bi-directional relationship between finance and growth. Demetriades & Hussein (1996) conducted a study on 16 less developed countries between 1960 and 1990 with the aid of time series technique. They observed long run relationship for indicators of financial development and per capita GDP in 13 countries. However, they found bi-directional causality in six countries and reverse causality in six countries while South Africa showed no evidence of causation between the variables.

The most motivating scenarios propose a two way causal relationship between finance and growth. Lewis (1995) hypothesizes a two way relationship between financial development and economic growth. This means that financial market develops as a consequence of economic growth which in turn feeds back as a stimulant to real growth. Several studies have equally noted this type of feedback. These include Patrick (1966), Greenwood and Jovanovic (1990), Wood (1993), Greenwood and Bruce

(1997) . Other empirical studies that are consistent with the bi-directional causality response are Akinboade (1998), Al-Yousif (2002) and Demetriades and Hussein (1996).

The above theoretical discussion of competing views and empirical evidence illustrate the controversy surrounding finance-growth causality. Moreover, the growth—finance mix is multifaceted among other reasons because government intervention in form of reforms could affect the relationship.

4 Methodology and data

The empirical investigation is carried out using annual data ranging from 1990-91 to 2010-11 which covers 21 annual observations. After reviewing the literature thoroughly, we have selected various dependent and independent variables for our present study that has been influenced by the various works carried out so far.

The principle data source in this paper is taken from Handbook of Statistics on Indian Economy.2011-12 and Indian Public Finance Statistics, 2011-12. All the variables are taken in their natural logarithms to reduce problems of heteroscedasticity to the maximum extent.

Using the time period, 1990-91 to 2010-11 for India, this study aims to examine the causal dynamic relationships between the level of financial development and economic growth in India. The estimation methodology employed in this study is the Unit root test and granger causality approach.

Although it is the widespread practice to consider cross-country regression to judge the growth effects of financial development, it is also important to study individual-country evidence like India at least at a simple level. For this purpose, out of several indicators of financial development, RGDS, which is the ratio of gross domestic savings to GDP and ROUTDEB, which is the ratio of' Outstanding Debt toGDP appears most appropriate since they have been used widely as a prime indicator of financial development and data for it are relatively more plentiful.

4.1 Regression by OLS technique

In this study, the association between financial development and economic growth is measured mainly by using the specification model of Rati Ram (1999), which was slightly modified growth model of Odedokun(1996) and later on, it is modified by author himself. The modified specification model can be written as follows:

$$LnGDP = \beta_0 + \beta_1 \, LnPOPU + \beta_2 \, LnEXPOR + \beta_3 \, LnRGDCF + \beta_4 \, LnRGDS + \beta_5 \, LnROUTDEB + \mu_t \qquad (1)$$

where,

GDP - annual growth rates of real GDP- The economic growth rate represented by the annual growth rate of gross domestic product (GDP);

POPU - annual population growth- The population growth rate has been used as the proxy for labor force growth which represented by the annual growth rate of total population;

EXPOR - annual growth of export- Real export variable represented by the annual growth rate of real commodities and services export. The inclusion of this variable is to measure the degree of trade openness which has a profound impact on the domestic economy;

RGDCF - the ratio of domestic capital formation to GDP- Real investment variable represented by the annual growth rate of real gross domestic fixed capital formation;

RGDS - the ratio of gross domestic savings to GDP.

ROUTDEB - the ratio of outstanding debt to GDP.

As cited above, RGDS and ROUTDEB being a fairly standard growth model of GDP are the financial development variable.

4.2 Unit root test

When dealing with time series data, a number of econometric issues can influence the estimation of parameters using OLS. Regressing a time series variable on another time series variable using the Ordinary Least Squares

(OLS) estimation can obtain a very high R^2, although there is no meaningful relationship between the variables. This situation reflects the problem of spurious regression between totally unrelated variables generated by a non-stationary process. Therefore, prior to testing and implementing the Granger Causality test, econometric methodology needs to examine the stationarity; for each individual time series, most macro economic data are non stationary, i.e. they tend to exhibit a deterministic and/or stochastic trend. Therefore, it is recommended that a stationarity (unit root) test be carried out to test for the order of integration. A series is said to be stationary if the mean and variance are time-invariant. A non-stationary time series will have a time dependent mean or make sure that the variables are stationary, because if they are not, the standard assumptions for asymptotic analysis in the Granger test will not be valid. Therefore, a stochastic process that is said to be stationary simply implies that the mean $[(E(Y_t)]$ and the variance [Var (Y_t)] of Y remain constant over time for all t, and the covariance [covar (Y_t, Ys)] and hence the correlation between any two values of Y taken from different time periods depends on the difference apart in time between the two values for all t≠s. Since standard regression analysis requires that data series be stationary, it is obviously important that we first test for this requirement to determine whether the series used in the regression process is a difference stationary or a trend stationary.

We also use a formal test of stationarity, that is, the Augmented Dickey-Fuller (ADF) test and Phillips- Perron (PP) Test. To test the stationary of variables, we use the Augmented Dickey Fuller (ADF) test which is mostly used to test for unit root. Following equation checks the stationarity of time series data used in the study:

$$\Delta y_t = \beta_1 + \beta_1 t + \alpha\, y_{t-1} + \gamma\, \sum_{t=1}^{n} \Delta y_{t-1} + \varepsilon_t \qquad (2)$$

Where ε_t is white nose error term in the model of unit root test, with a null hypothesis that variable has unit root. The ADF regression test for the existence of unit root of y_t that represents all variables at time t. The test for a unit root is conducted on the coefficient of y_{t-1} in the regression. If the coefficient is significantly different from zero (less than zero) then the hypothesis that y contains a unit root is rejected. The null and alternative hypothesis for the existence of unit root in variable y_t is H_0; $\alpha = 0$ versus H1: $\alpha < 0$. Rejection of the null hypothesis denotes stationarity in the series.

If the ADF test-statistic (t-statistic) is less (in the absolute value) than the Mackinnon critical t-values, the null hypothesis of a unit root can not be rejected for the time series and hence, one can conclude that the series is non-stationary at their levels. The unit root test tests for the existence of a unit root in two cases: with intercept only and with intercept and trend to take into the account the impact of the trend on the series.

The PP tests are non-parametric unit root tests that are modified so that serial correlation does not affect their asymptotic distribution. PP tests reveal that all variables are integrated of order one with and without linear trends, and with or without intercept terms. Phillips–Perron test (named after Peter C. B. Phillips and Pierre Perron) is a unit root test. That is, it is used in time series analysis to test the null hypothesis that a time series is integrated of order 1. It builds on the Dickey –Fuller test of the null hypothesis $\delta = 0$ in $\Delta\, y_t = \delta y_{t-1} + u_t$, here Δ is the first difference operator. Like the augmented Dickey Fuller test, the Phillips–Perron test addresses the issue that the process generating data for y_t might have a higher order of autocorrelation than is admitted in the test equation - making y_{t-1} endogenous and thus invalidating the Dickey–Fuller t-test. Whilst the augmented Dickey Fuller test addresses this issue by introducing lags of $\Delta\, y_t$ as regressors in the test equation, the Phillips–Perron test makes a non-parametric correction to the t-test statistic. The test is robust with respect to unspecified autocorrelation and heteroscedasticity in the disturbance process of the test equation.

4.3 Granger causality test

Causality is a kind of statistical feedback concept which is widely used in the building of forecasting models. Historically, Granger (1969) and Sim (1972) were the ones who formalized the application of causality in economics. Granger causality test is a technique for determining whether one time series is significant in forecasting another (Granger, 1969). The standard Granger causality test (Granger, 1988) seeks to determine whether past values of a variable helps to predict changes in another variable. The definition states that in the conditional distribution, lagged values of Y_t add no information to explanation of movements of X_t beyond that provided by lagged values of X_t itself (Green, 2003). We should take note of the fact that the Granger causality technique measures the information given by one variable in explaining the latest value of another variable. In addition, it also says that variable Y is Granger caused by variable X if variable X assists in predicting the value of variable Y. If this is the case, it means that the lagged values of variable X are statistically significant in explaining variable Y.

The null hypothesis (H_0) that we test in this case is that the X variable does not Granger cause variable Y and variable Y does not Granger cause variable X. In summary, one variable (X_t) is said to granger cause another variable (Y_t) if the lagged values of X_t can predict Y_t and vice-versa.

5 Analysis of results

Tables 2 and 3 present the results of the unit root test. The results show that all the variables of our interest, namely GDP ,POPU ,EXPOR ,RGDCF,RGDS,ROUTDEB did not attain stationarity after first differencing, I(1), using ADF test. The augmented Dickey Fuller Test fails to provide result of stationary at first difference at all lag differences. The results indicate that the null hypothesis of a unit root can not be rejected for the given variable as none of the ADF value is not smaller than the critical t-value at 1%, 5% and 10% level of significance for all variables and, hence, one can conclude that the variables are not stationary at their levels and first differences in ADF test.

Table 2. Unit Root Test: The Results of the Augmented Dickey Fuller (ADF) Test for Level &First differences with an Intercept and Linear Trend

	ADF Test											
Variables	**Levels**						**First Differences**					
	Intercept			**Intercept & Trend**			**Intercept**			**Intercept & Trend**		
	Lag0	Lag1	Lag2	Lag0	Lag1	Lag2	Lag0	Lag1	Lag2	Lag0	Lag1	Lag2
LnGDP	1.08	0.857	0.622	-1.66	-1.43	-1.51	-4.23	-2.59	-1.95	-4.43	-2.75	-2.07
LnPOPU	-8.19	-4.08	-5.09	0.602	0.438	0.022	-1.35	-0.409	-0.433	-4.67	-5.18	-2.38
LnEXPOR	-0.614	-0.346	0.151	-2.70	-1.75	-2.49	-5.69	-2.31	-2.33	-5.37	-2.15	-2.21
LnRGDCF	-0.647	-0.538	-0.985	-3.04	-1.73	-2.19	-5.96	-2.58	-2.37	-5.64	-2.39	-2.20
LnRGDS	-0.694	-0.681	-1.11	-2.58	-1.71	-2.04	-5.54	-2.65	-2.22	-5.30	-2.51	-2.00
LnROUTDEB	-2.21	-1.97	-1.77	-1.26	-1.09	-1.28	-4.05	-2.31	-1.80	-4.55	-2.72	-1.99
Critical Values												
1%	-3.8067			-4.5000			-3.8304			-4.5348		
5%	-3.0199			-3.6591			-3.0294			-3.6746		
10%	-2.6502			-3.2677			-2.6552			-3.2762		

Source: Author's own estimate

ADF tests specify the existence of a unit root to be the null hypothesis.

Ho: series has unit root; H_1: series is trend stationary.

To circumvent the low power in the standard unit root tests, PP test is applied to test the null of stationary real exchange against the alternative of non-stationarity. The results of applying the PP test on these variables show strong evidence of stationarity since the null of stationarity is accepted at the 1, 5 and 10

percent significance level. An inspection of the figures reveals in table-2 that each series is first difference stationary at 1%,5% and 10% level using the PP test. However, the ADF test result is not as impressive, as all the variables did not pass the differenced stationarity test at the one, five and ten percent levels. We therefore rely on the PP test result as a basis for a co integration test among all stationary series of the same order meaning that the two series are stationary at their first differences.

Table 3. Unit Root Test: The Results of the Phillips-Perron (PP) Test for Level &First differences with an Intercept and Linear Trend

Variables	PP Test											
	Levels						First Differences					
	Intercept			Intercept & Trend			Intercept			Intercept & Trend		
	Lag0	Lag1	Lag2	Lag0	Lag1	Lag2	Lag0	Lag1	Lag2	Lag0	Lag1	Lag2
LnGDP	1.08	1.16	1.16	-1.67	-1.67	-1.69	-4.23	-4.22	-4.23	-4.23	-4.44	-4.73
LnPOPU	-8.20	-8.41	-8.98	0.602	0.732	0.941	-1.35	-1.08	-0.959	-4.67	-4.74	-4.87
LnEXPOR	-0.614	-0.660	-0.631	-2.69	-2.66	-2.76	-5.69	-5.65	-5.56	-5.37	-5.34	-5.29
LnRGDCF	-0.647	-0.528	-0.637	-3.04	-3.05	-3.08	5.96	-5.92	-5.81	-5.64	-5.60	-5.52
LnRGDS	-0.694	-0.583	-0.649	-2.57	-2.57	-2.68	-5.54	-5.53	-5.46	-5.30	-5.30	-5.24
LnROUTDEB	-2.21	-2.29	-2.28	-1.26	-1.24	-4.05	-4.07	-4.052	-4.063	-4.55	-4.55	-4.59
Critical Values												
1%	-3.8067			-4.5000			-3.8304			-4.5348		
5%	-3.0199			-3.6591			-3.0294			-3.6746		
10%	-2.6502			-3.2677			-2.6552			-3.2762		

Source: Author's own estimate

PP tests specify the existence of a unit root to be the null hypothesis.

Ho: series has unit root; H_1: series is trend stationary

The null hypotheses of the Granger-Causality test are:

H0: X ≠ Y (X does not granger-cause Y)

H1: X ≠Y (X does Granger-cause Y)

We have found that both for the Ho of "LnGDP does not Granger Cause LnEXPOR" and Ho of "LnEXPOR does not Granger Cause LnGDP" , we cannot reject the Ho since the F-statistics are rather small and most of the probability values are close to or even greater than 0.1 at the lag

length of 2. Therefore, we accept the Ho and conclude that LnGDP does not Granger Cause LnEXPOR and LnEXPOR does not Granger Cause LnGDP.Likewise, population growth does not granger causes economic growth and vice versa and ratio of outstanding debt to GDP does not granger cause economic growth and vice versa. But ratio of gross domestic capital formation to GDP granger causes economic growth and ratio of gross domestic savings granger causes unidirectional economic growth at 5% level.

Therefore, the above results generally show that there is unidirectional causality between ratio of

gross domestic capital formation to GDP and ratio of gross domestic savings to GDP and

economic growth in Indian context.

Table 4. Granger Causality test

Pairwise Granger Causality Tests				
Lags: 2				
	Obs.	F-Statistic	Probability	Decision
LnGDP does not Granger Cause LnEXPOR	19#	1.06826	0.37002	Accept
LnEXPOR does not Granger Cause LnGDP		1.56408	0.24374	Accept
LnPOPU does not Granger Cause LnGDP	19	0.97607	0.40102	Accept
LnGDP does not Granger Cause LnPOPU		0.21070	0.81254	Accept
LnRGDCF does not Granger Cause LnGDP	19	6.21709	0.01169*	Reject
LnGDP does not Granger Cause LnRGDCF		1.13418	0.34954	Accept
LnRGDS does not Granger Cause LnGDP	19	6.75411	0.00884*	Reject
LnGDP does not Granger Cause LnRGDS		0.36455	0.70091	Accept
LnROUTDEB does not Granger Cause LnGDP	19	1.36974	0.28622	Accept
LnGDP does not Granger Cause LnROUTDEB		0.11991	0.88790	Accept

Source: Author's own estimate
Observations after lag.
*(**) Indicates significant causal relationship at 5 (10) significance level.

Table 5 shows the estimated results of the model by using OLS. All variables have the expected signs as formulated in the model. The relationship between GDP and population growth and outstanding debt are statistically significant. But the relationship between GDP and export, gross domestic capital formation, gross domestic savings are not statistically significant because the calculated t-value of them is lower than the critical t-values at 5 or 10% level of significance.

Table: 5: Regression results

Dependent Variable: LnGDP
Method: Least Squares
Sample: 1990-91 to 2010-11
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-34.30585	6.347608	-5.404531	0.0001
LnEXPOR	0.073788	0.076285	0.967259	0.3488
LnPOPU	6.726146	1.046975	6.424359	0.0000
LnRGDCF	-0.117793	0.258833	-0.455093	0.6556
LnRGDS	0.346268	0.270374	1.280702	0.2197
LnROUTDEB	-1.145956	0.142692	-8.030969	0.0000

R-squared	0.997339	Mean dependent var	14.53448
Adjusted R-squared	0.996452	S.D. dependent var	0.490226
S.E. of regression	0.029199	Akaike info criterion	-3.994382
Sum squared resid	0.012789	Schwarz criterion	-3.695947
Log likelihood	47.94101	F-statistic	1124.469
Durbin-Watson stat	0.574873	Prob(F-statistic)	0.000000

Source: Own estimate.

6 Conclusion

The objective of this article is to explore the causal relationship between financial development growth in India over the period from 1990-91 to 2010-11. The estimated results confirmed that financial development, measured by ratio of gross domestic capital formation to GDP , ratio of gross domestic savings to GDP, etc are non-stationary at the level data and at the first differences when using ADF test but attains stationary at first difference while using PP test.

The Granger- causality test finally confirmed that financial development granger causes economic growth in India between time span of 1990-91 to 2010-11.There does exist unidirectional causality which runs from gross domestic capital formation and gross domestic savings to GDP growth. No causality exists between export growth, population growth, outstanding debt ratio and GDP growth. Therefore, financial development in India has a stronger role in the growth process. The implication of the above is that India is in a better state of affairs as far as the growth potential is concerned by way of a more efficient financial system that is likely to evolve in the upcoming years to suit the changing global pursuit.

Consequently, government has to intensify the financial sector and carry out crucial measures to reinforce the long run relationship between financial development and economic growth in order to maintain sustainable economic growth. These measures embrace more financial integration, minimization of government intervention in the financial systems, escalating the status of financial institutions, etc. It is recommended that financial systems need developed financial markets, which may complete its deepening to affect economic growth optimistically. For financial deepening, not only multiplicity in financial institutions, but also diversity in financial instruments is imperative.

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